

NO₂ variations over India (2005-2010) using OMI - AURA data

Dimitris Kaskaoutis[†]; Waseem Medhi; Rajesh Kumar; Ramesh Singh; Ritesh Gautam; R Jenamani

[†] Sharda University, India

Leading author: dimitriskask@hotmail.com

During the last decades the atmospheric aerosol concentration have been dramatically increased over south Asia due to rapid increase in population, urbanization, industrialization and demands for energy that have significant impact on solar dimming phenomenon, heating of the middle and upper troposphere, melting of Himalayas glaciers and feedback on the onset and intensity of the local monsoon system. The present study analyzes the NO₂ spatio-temporal variations over India based on Aura-OMI observations (spatial resolution of 0.250 x 0.250) during the period 2005-2010. The results show enhanced NO₂ amounts over the urban centers and industrialized areas, as expected, due to large emissions of fossil-fuel combustion aerosols and pollutants as well as increased NO₂ values over agricultural areas influenced by seasonal forest fires or crop-residue burning, i.e. Punjab and Orissa states. The monthly-mean variation of the NO₂ is found to be higher over the densely populated and industrialized Indo-Gangetic Plains (IGP), mainly during pre-monsoon period (April-June) over this area. The NO₂ spatial-averaged over Punjab state which is one of the agriculturally productive states show pronounced increase in NO₂; this increase is found to be associated with the burning of crop-residue in the months of May and October. The monthly and seasonal variations of NO₂ over specific areas are found to be closely associated with the fire counts obtained from MODIS. A seasonal climatology of NO₂ and corresponding aerosol optical properties and its impact on the winter haze, smog and fog will be presented for the period 2005-2010.